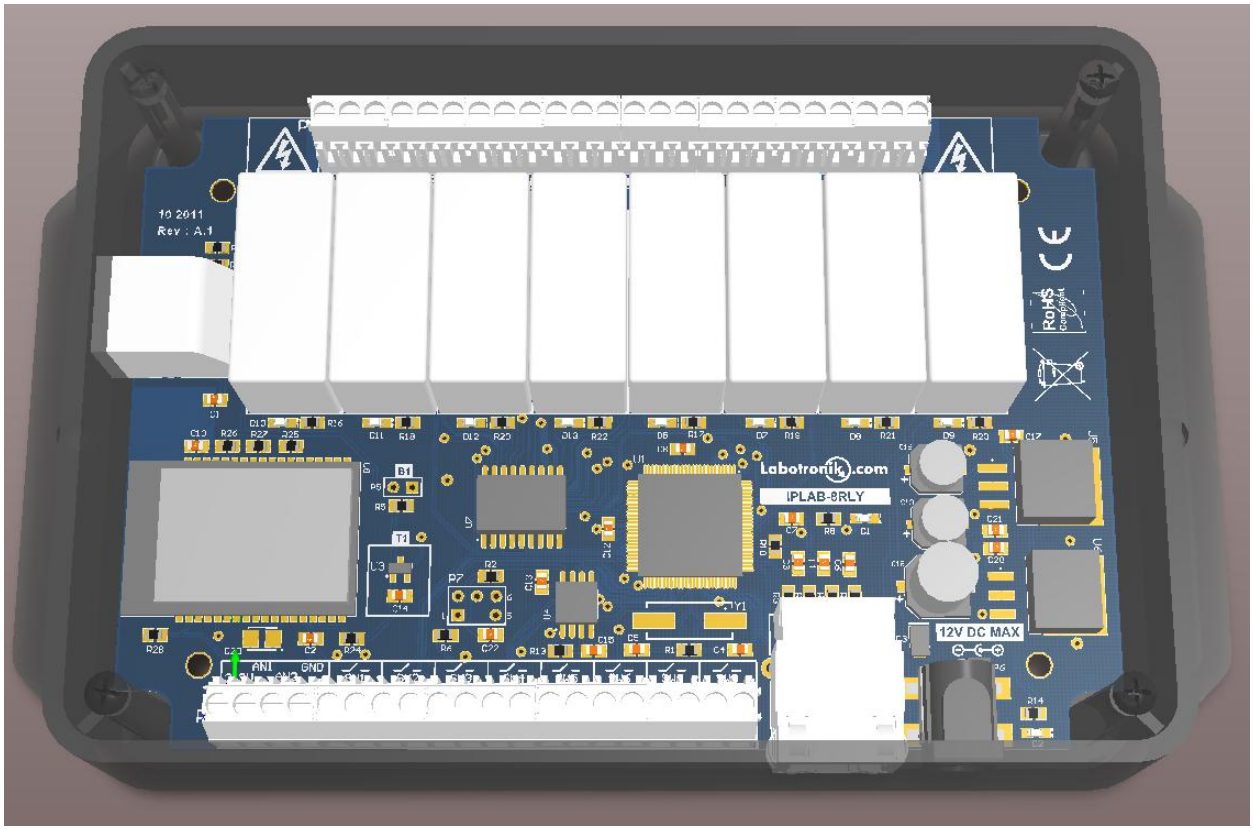
IPLAB-8-RLY

User Manual



V1.0-12/2011 © LabotroniK

SUMMARY

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1. Overview

IPLab-8-RLYincluded 8 relays SPDT driven by Ethernet, 8 dry discrete and 2 analog input

- Relays can drive signal up to **230VAC** and **10A**
- Discrete input are designed to read dry contact from switch
- Analog input are designed to monitor input up to 3.3VDC

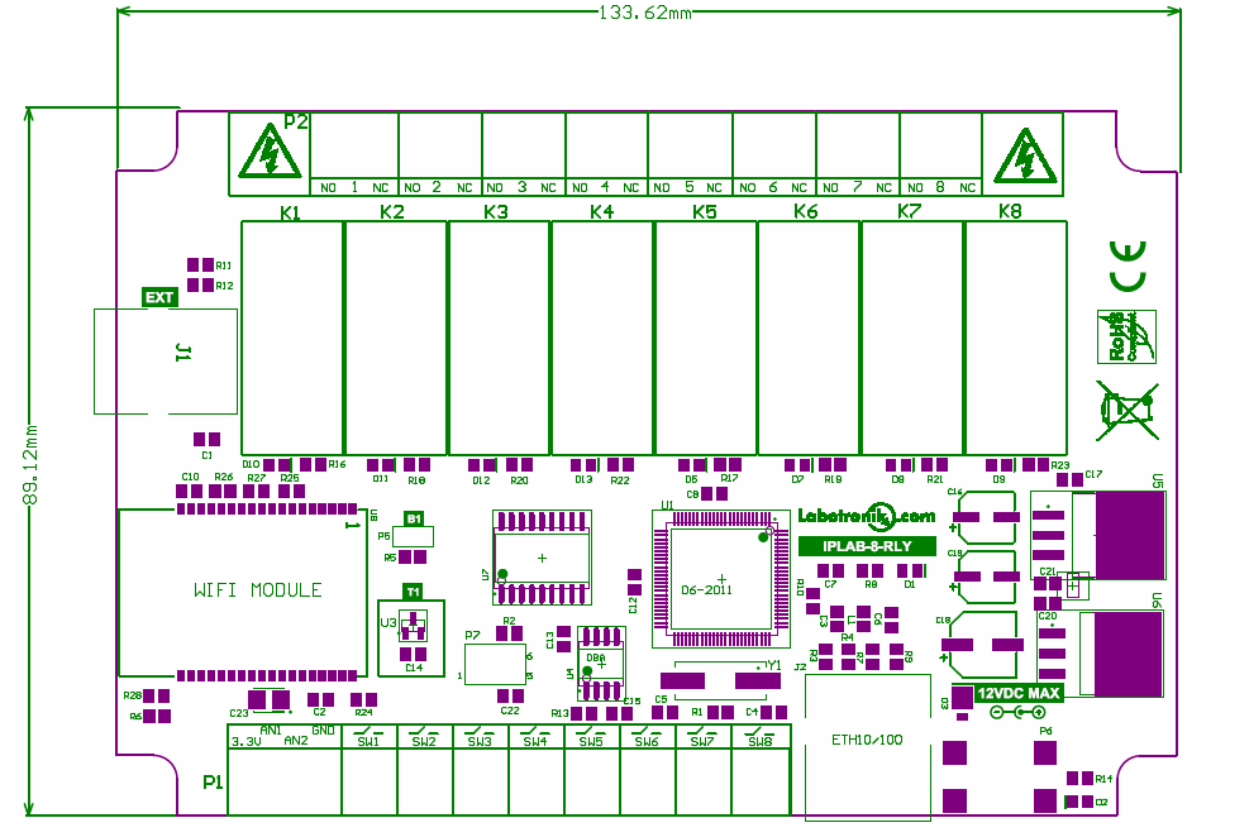
WARNING

To prevent electrical shock it is not recommended to drive signals above 50 VAC or 110 VDC when you are using the board without enclosure.

During external connection to terminal bloc, you must use isolated screwdriver and power-off driven equipment master power supply

IP-Lab board is intended to be use by professional people who are aware of electrical danger and understanding the potential hazard of inserting an external element in an electrical circuit

1.1. Board Overview



P1 : Analog and Digital input connector	T1 : On board thermal sensor
P2 : terminal blocks for relays	BP1 : Jumper to recover factory configuration
K1 to K8 : Relays	WIFI module and J1extension connector : optional

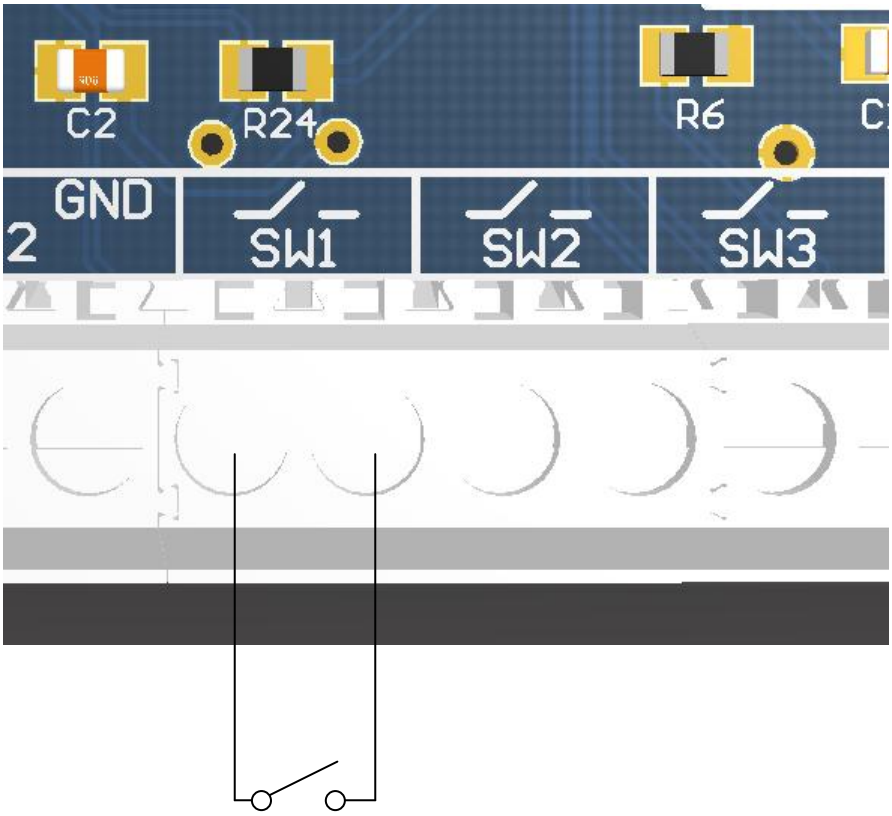
2. Signal mapping

2.1. Discrete mapping

Digital input signal are connected to SW1 to SW8. Only dry switch shall be routed to discrete input terminal block.

Never apply voltage in these connectors

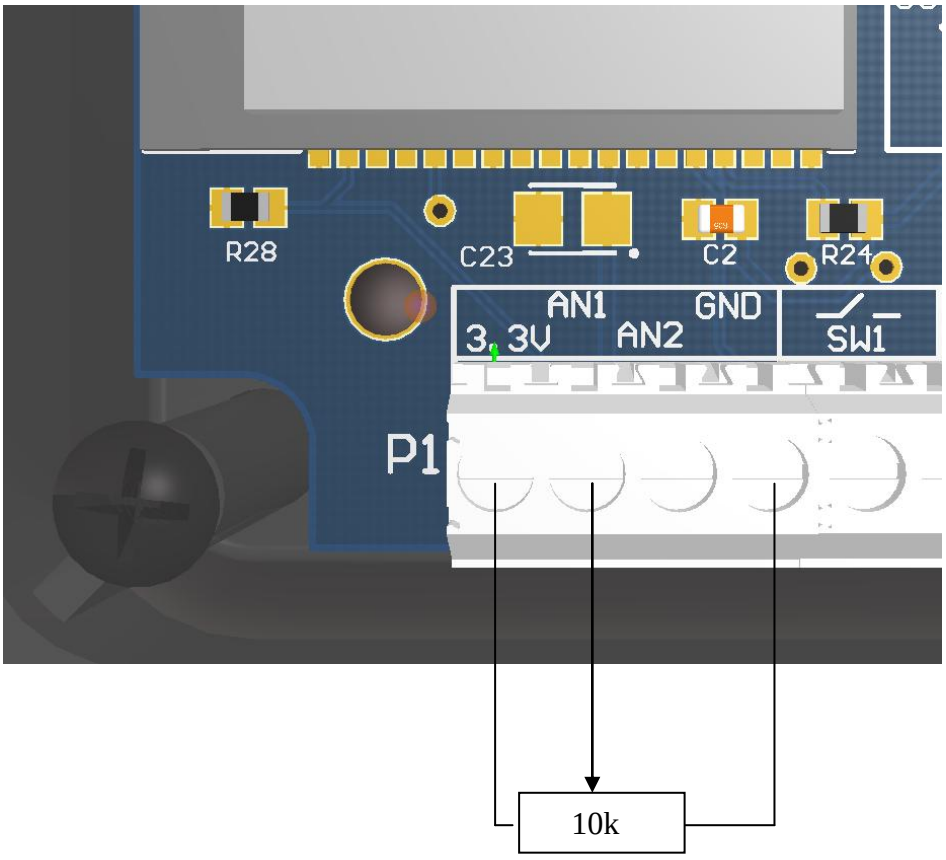
Wiring example: In the following example, one switch is wired to input SW1



2.2. Analog input wiring

The board can read 2 analog signals : AN1 and AN2
Analog input voltage range is from 0 to +3.3V.
Ground and 3.3V are available beside signals AN1 and AN2 to facilitate configuration in voltage divider.

Potentiometer connected to AN1 :



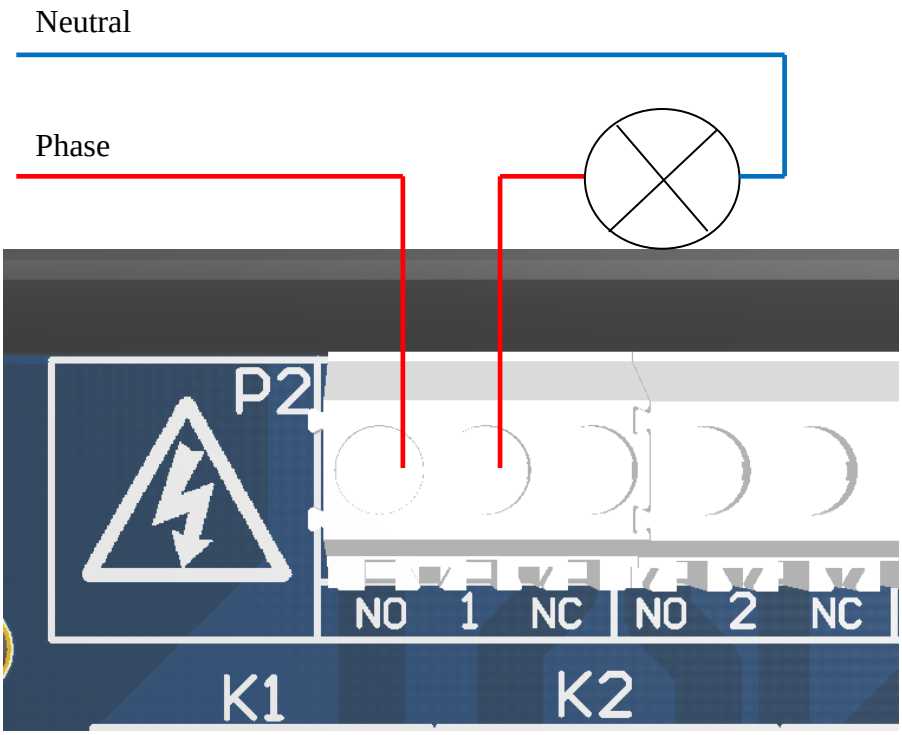
Note: Unconnected analog input is a floating input. It is recommended to insert a pull-up or pull-down resistor to fix this indeterminate situation.
You can, for example insert 10k ohms resistor between unconnected analog input and GND if you want to **maintain value to 0**.

2.3. Power output

Available signals for relays K1 to K8 are: Common point, Normally Open (NO) and Normally Close (NC)

Each number in front of terminal block P7 represents the common pin for the corresponding relay.

Example of lamp connection to relay 1, normally open relay :



WARING :
when you connect or disconnect wire to the board, shutdown master electrical power supply

3. First Start

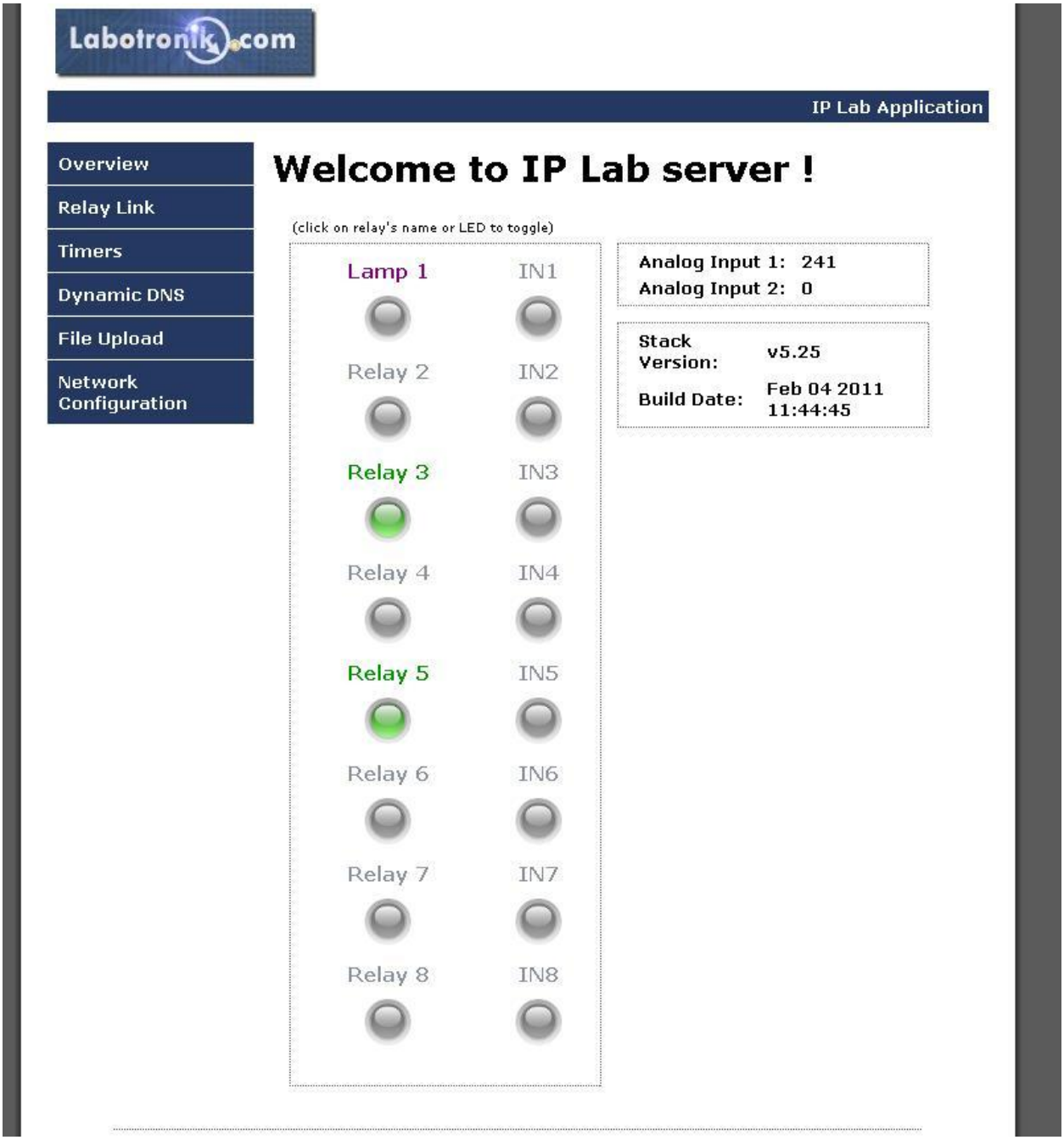
IPLab operates as a web server. So you don't have to install any driver to communicate with. Card's functionalities are available via the web server and UDP protocol.

The java application TCPIP Discover.jar, available on the website www.labotronik.com, helps you to find the board over Ethernet.

When you first power on the board, or if you press the software button “discover device” the card will send his IP and MAC address over the local network. Then you know the board is correctly configured and present.

After that, you can reach the board by his IP address on your browser or by entering his default name: http://IPLab

Your browser is now connected to the board and the following home page will appear:



4. Software configuration

- In the master frame, left column shows the relay state and the right column the input state
- Upper right frame is for analog input (from 0 to 1024, corresponding to 0V and 3.3V) and T1 temperature
- Lower frame is for debug purpose.
- To toggle relay state, just click on the corresponded relay name or light state.
- Input LED is active if corresponding switch close

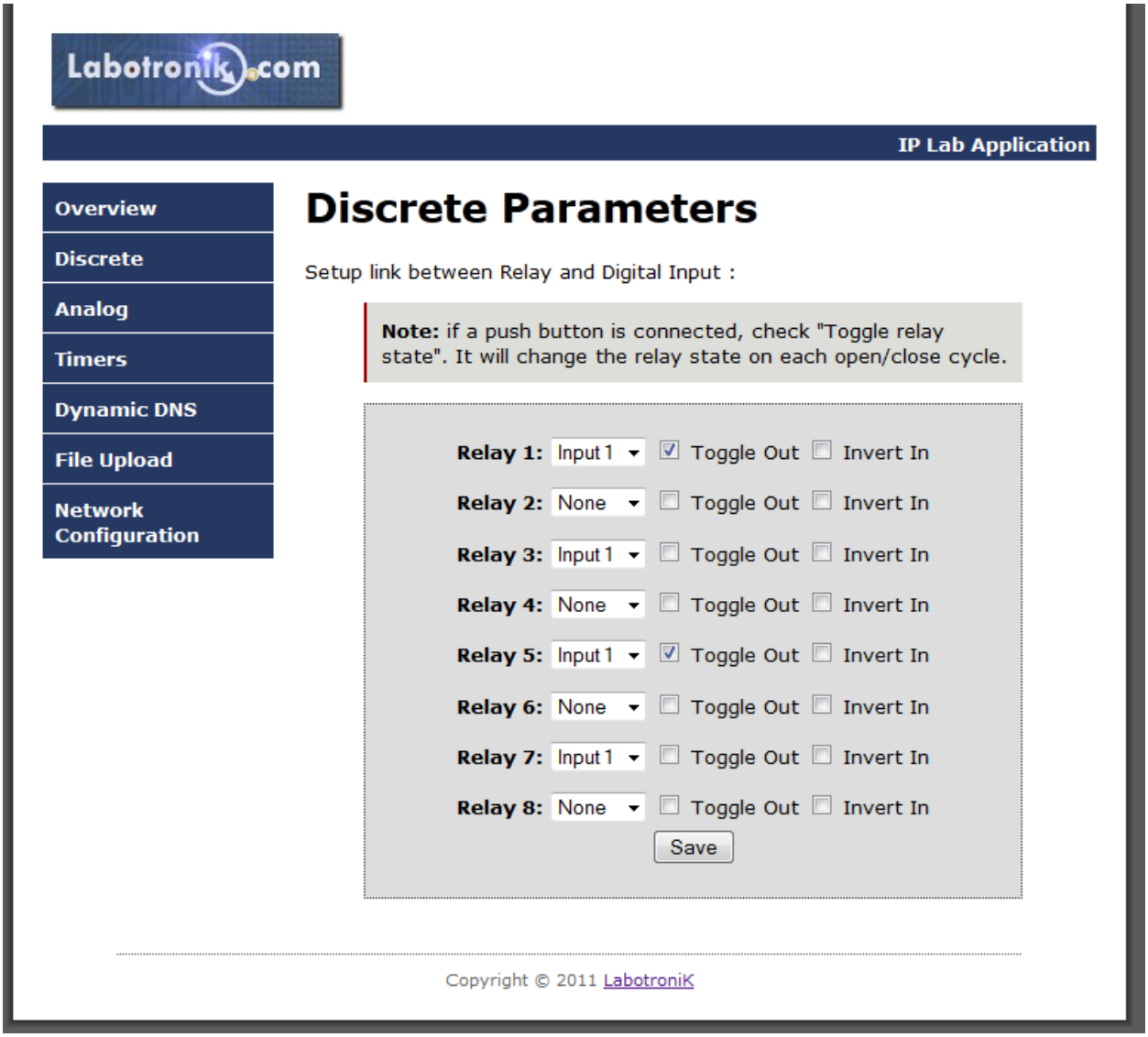
Configuration pages are password protected. By default enter

Login : admin
Password : admin

You can modify them in the network configuration menu

4.1. Discrete Parameters

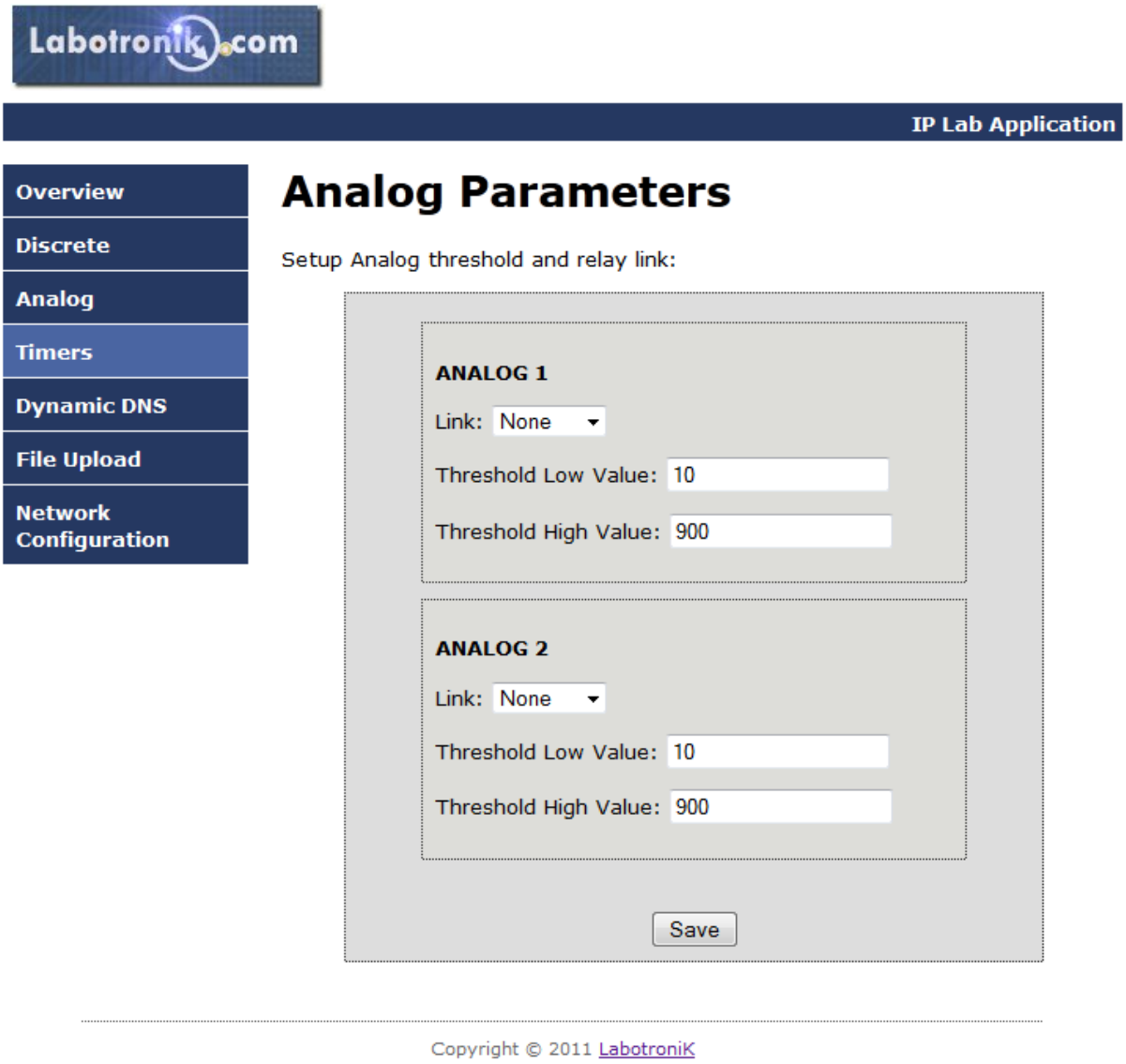
This page allows you to configure relay, depending on discrete input status.


Labotronik.com
IP Lab Application
Overview
Discrete
Analog
Timers
Dynamic DNS
File Upload
Network Configuration
Discrete Parameters
Setup link between Relay and Digital Input :
Note: if a push button is connected, check "Toggle relay state". It will change the relay state on each open/close cycle.
Relay 1: Input 1 Toggle Out Invert In
Relay 2: None Toggle Out Invert In
Relay 3: Input 1 Toggle Out Invert In
Relay 4: None Toggle Out Invert In
Relay 5: Input 1 Toggle Out Invert In
Relay 6: None Toggle Out Invert In
Relay 7: Input 1 Toggle Out Invert In
Relay 8: None Toggle Out Invert In
Save
Copyright © 2011 LabotroniK

- Within this page you can link relay to discrete input state.
- With the “toggle out” option set, corresponding relay state will change at each falling edge. This is typically use if you have connected a push button.
  For example, this option could be set if you want to drive a lamp in a house with a push button.
- The “Invert In” option will invert the logic. Relay will be set to active if corresponding input is open.

Note : when a relay is linked to digital input, his label color changed in the webserver home page and become purple. Then, you **can't manually** toggle relay to active state because of the link

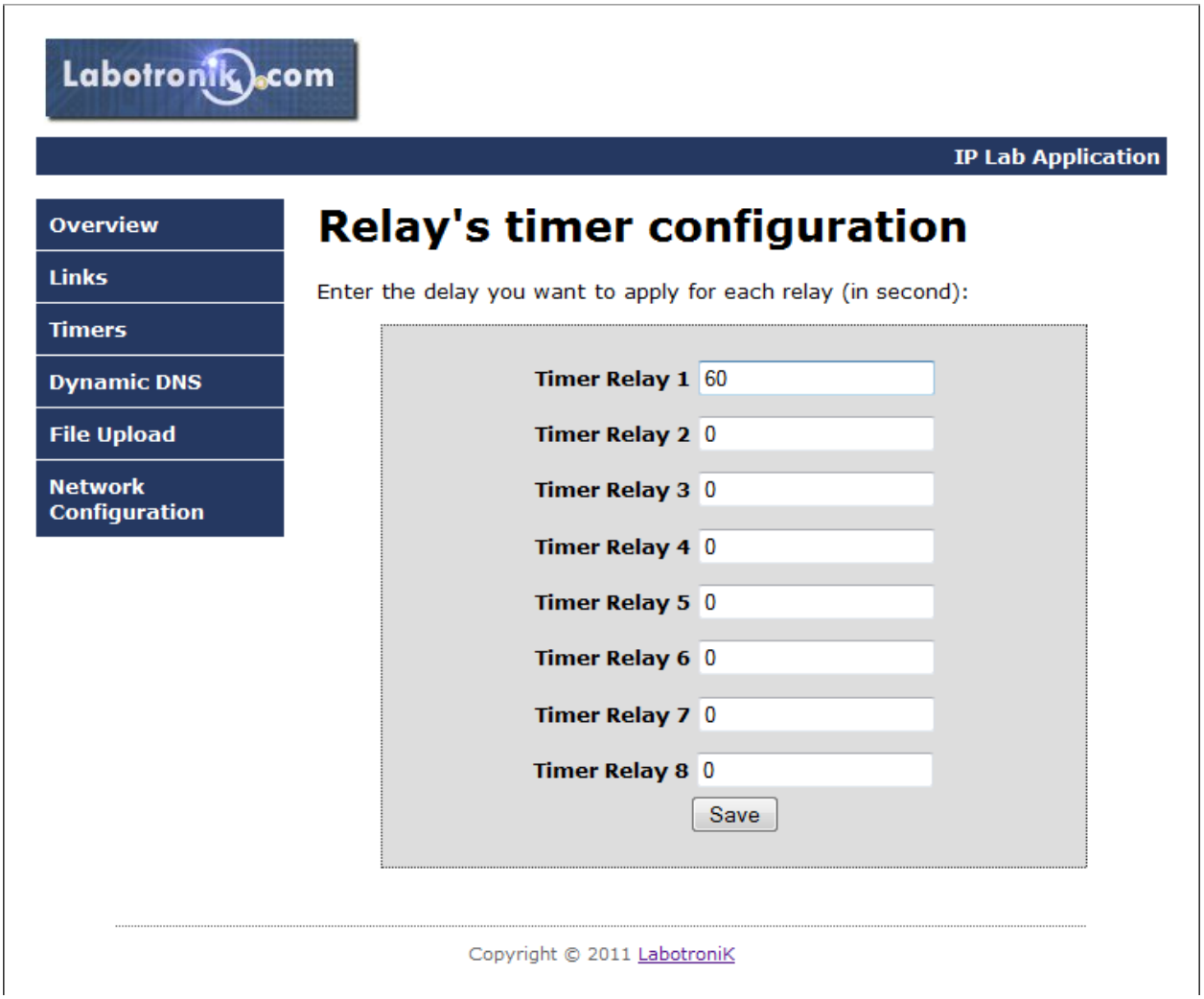
4.2. Analog Input



- This menu allows you to link analog input value to a relay. If corresponding analog input value is within the desire range, relay will be set to active.

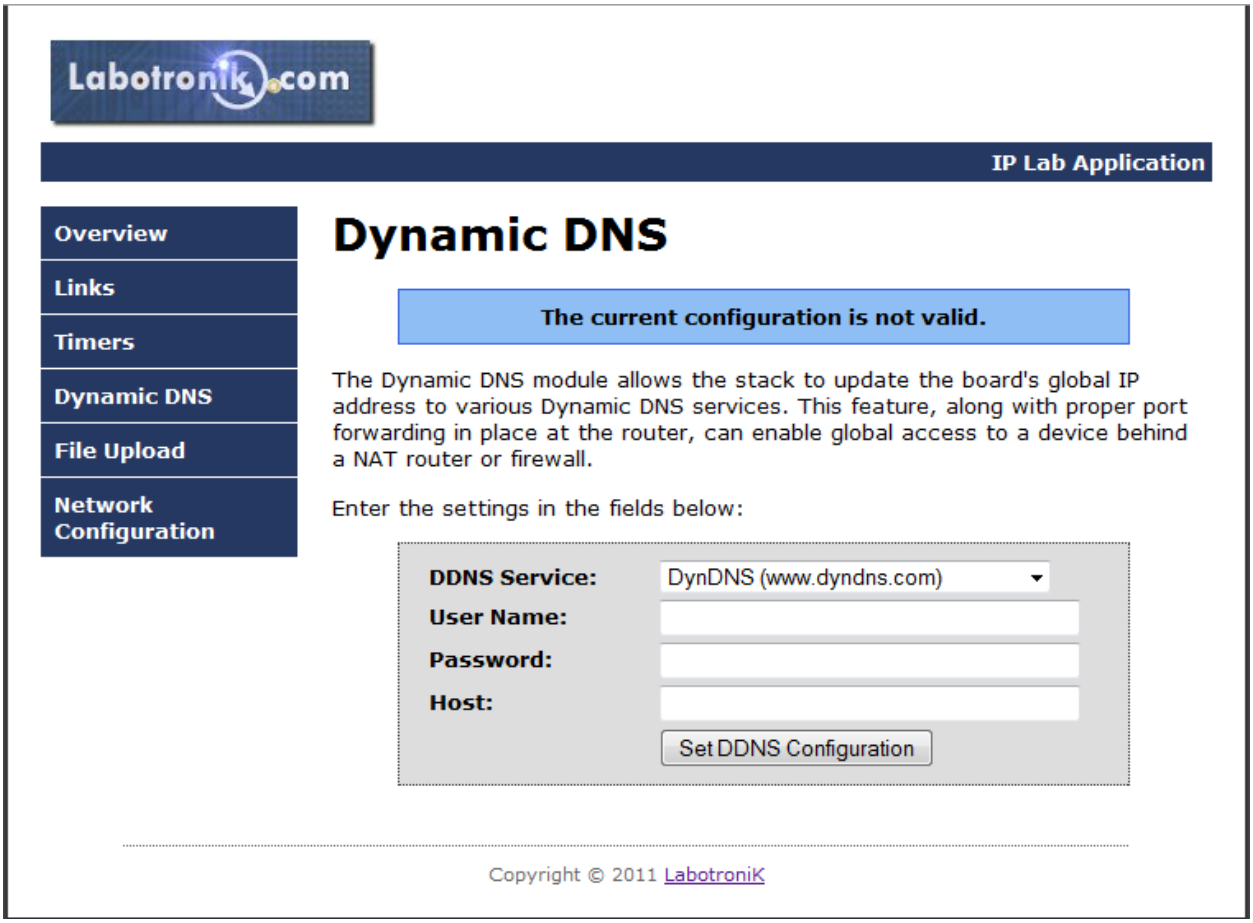
- Threshold values are without unit. It corresponds to the value read by the Analog to Digital Converter (ADC). Maximum value is 1024 (10 bit DAC), and minimum is 0

4.3. Timer Menu



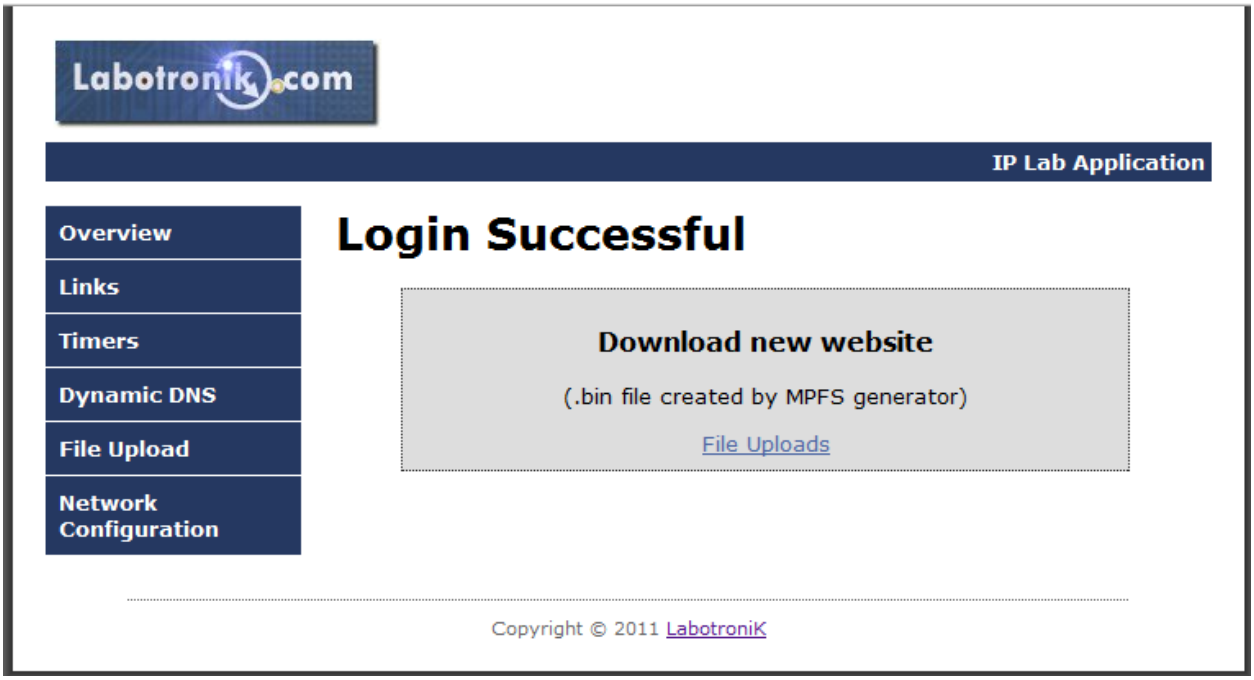
- Each relay can be configuring with a timer delay.
- The number in the field represent this time, in seconds
- If a relay is set to active state and the timer value is greater than 0, then relay will be active during this value period and will be automaticaly set to off after that.
- In the example above, a 60seconds timer is set to relay 1. So relay 1 will be deactivate after 60 seconds without manual action or active input link
- Timer delay unit is seconds

4.4. Dynamic DNS


Labotronik.com
IP Lab Application
Overview
Links
Timers
Dynamic DNS
File Upload
Network Configuration
Dynamic DNS
The current configuration is not valid.
The Dynamic DNS module allows the stack to update the board's global IP address to various Dynamic DNS services. This feature, along with proper port forwarding in place at the router, can enable global access to a device behind a NAT router or firewall.
Enter the settings in the fields below:
DDNS Service:
DynDNS (www.dyndns.com)
User Name:
Password:
Host:
Set DDNS Configuration
Copyright © 2011 LabotroniK

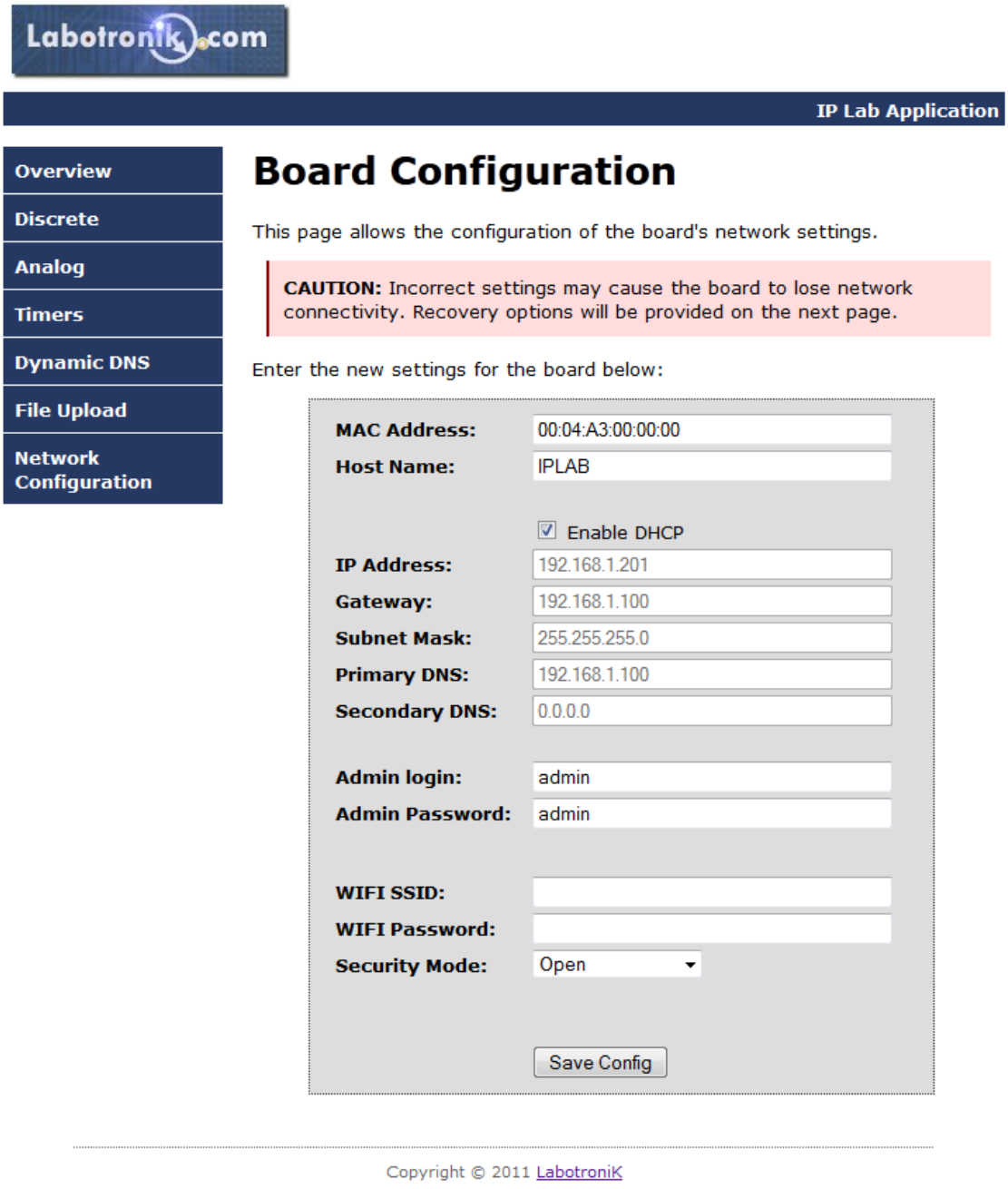
This page allow you to configure the board with a Dynamic DNS client (like www.noi-po.com for example) to reach the board from internet if you don't have a static IP at home.

4.5. File upload



You can download a new version of the webserver with this page.
It accepts .bin file compiled with application MPFS2.exe available on the web site labotroniK.com

4.6. Network Configuration Menu



To configure low level network parameters such as MAC address or IP address

Warning, if you enter invalid parameter card could be unreachable

4.7. Drive the card by UDP protocol

You can drive the card by sending commands to the **UDP Port N° 30302**

Command list, with x and y as function parameters :

Command	Function	Description	Paremeter value	Board response
SRx	Set Relay x	activate relay x	X = 1 to 8	OK
CRx	Clear Relay x	Desactivate relay x	X = 1 to 8	OK
GRx	Get Relay x	Get relay x state	X = 1 to 8	1 or 0
GIx	Get Input x	Get Input x state	X = 1 to 8	1 or 0
GAx	Get Analog x	Get Analog x value	X = 1 or 2	0 to 1024(0 for 0V and 1024 for 3.3V, AD converter accuracy is 10 bits)
SLIxRy	Set Link Input x to Relay y	Set connection between digital input and relay	X= 1 to 8 Y= 1 to 8	OK
SLAxRy	Set Link Analog x Relay y	Set connection between analog input and relay	X= 1 to 8 Y= 1 to 8	OK
SAxTHyyyy	Set Analog x Threshold High yyyy	Set analog thresolh high value for relay x	X=1 to 8 Y=0000 to 1024	waring: parameter y must be on 4 digits
SAxTLyyyy	Set Analog x Threshold LowHigh yyyy	Set analog thresolh low value for relay x	X=1 to 8 Y=0000 to 1024	waring: parameter y must be on 4 digits
GAxTH	Get Analog x Threshold High	Get Analog x Threshold High value	X=1 to 8	0 to 1024
GAxTL	Get Analog x Threshold Low	Get Analog xThreshold Low value	X=1 to 8	0 to 1024
CLRx	Clear Link Relay x	to reset all existing link for relay x (analog and discrete)	X=1 to 8	OK
?	Board information			Firmware version

About the threshold values for analog inputs :

To avoid undesired relay state on transition threshold, analog input does work with hysteresis value.

Thus, Analog input linked to a relay will set it to active state if Analog threshold High value is reach.
And relay will be disable when analog value reach the Threshold low value

Example of UDP sequence run within python script (available on the website)

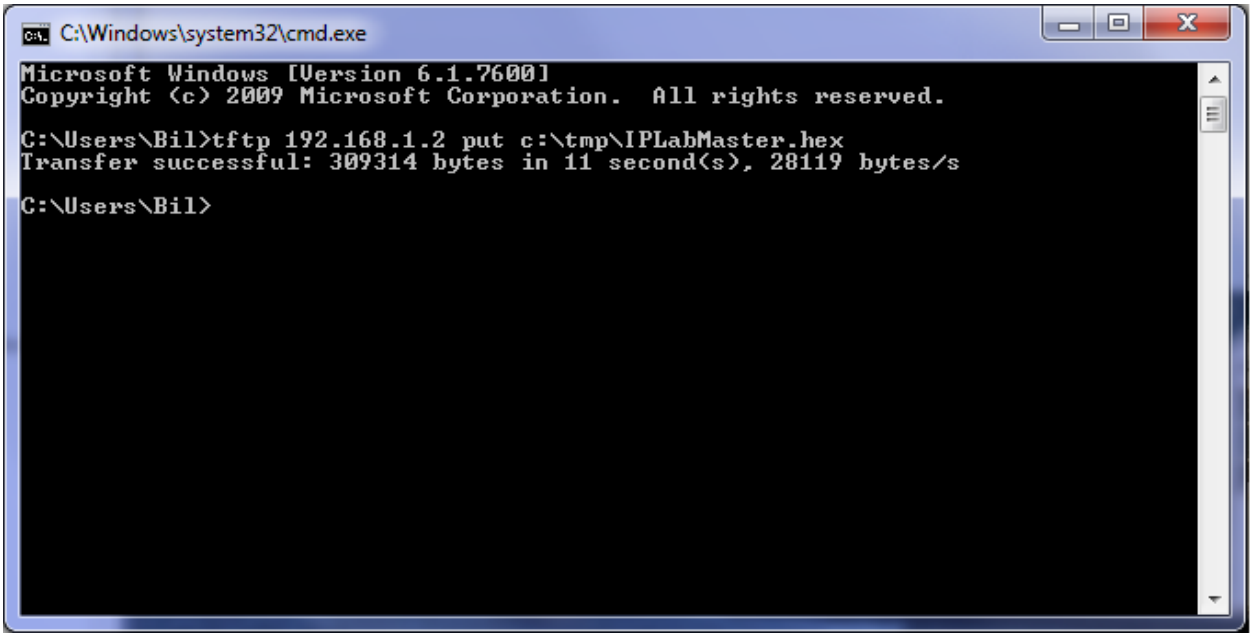


5. Firmware update

To update the firmware :

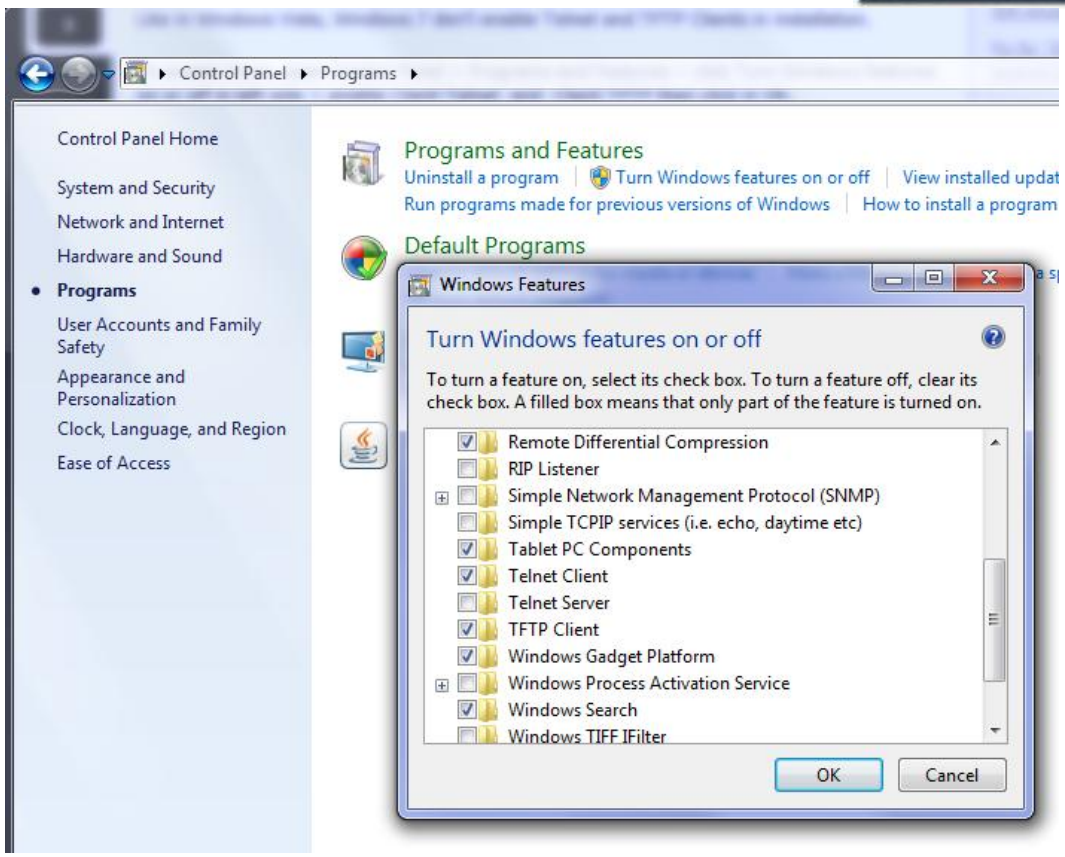
- Download the latest version from the website www.labotronik.com
- Unzip if needed
- Enter the following command :
  Tftp *IP_ADDRESSe* put *FIRMWARE_LOCATION*

- Example if the board is at the address 192.168.1.2 :


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\Bil>tftp 192.168.1.2 put c:\tmp\IPLabMaster.hex
Transfer successful: 309314 bytes in 11 second(s), 28119 bytes/s
C:\Users\Bil>

Information :

- To enter this command, click on « start » then enter « cmd »
- Under windows 7 to activate tft function, go into start->control panel-> programs->turn windows features on or off-> check « tftp client»

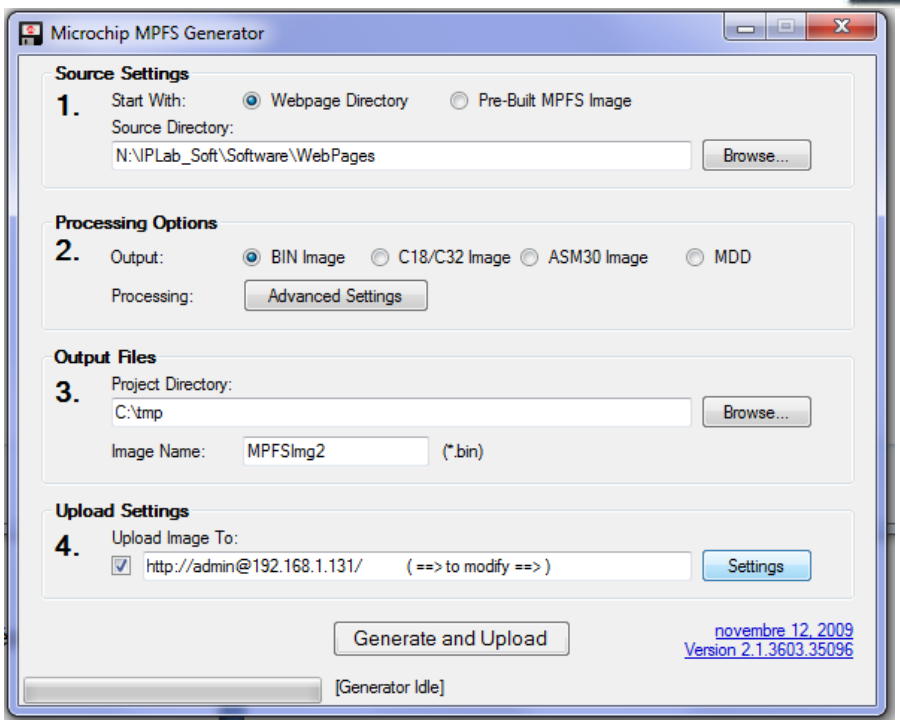

Control Panel ▸ Programs ▸
Control Panel Home
System and Security
Network and Internet
Hardware and Sound
Programs
User Accounts and Family Safety
Appearance and Personalization
Clock, Language, and Region
Ease of Access
Programs and Features
Uninstall a program
Turn Windows features on or off
View installed updat
Run programs made for previous versions of Windows
How to install a program
Default Programs
Windows Features
Turn Windows features on or off
To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.
Remote Differential Compression
RIP Listener
Simple Network Management Protocol (SNMP)
Simple TCPIP services (i.e. echo, daytime etc)
Tablet PC Components
Telnet Client
Telnet Server
TFTP Client
Windows Gadget Platform
Windows Process Activation Service
Windows Search
Windows TIFF IFilter
OK
Cancel

6. Create you own web page

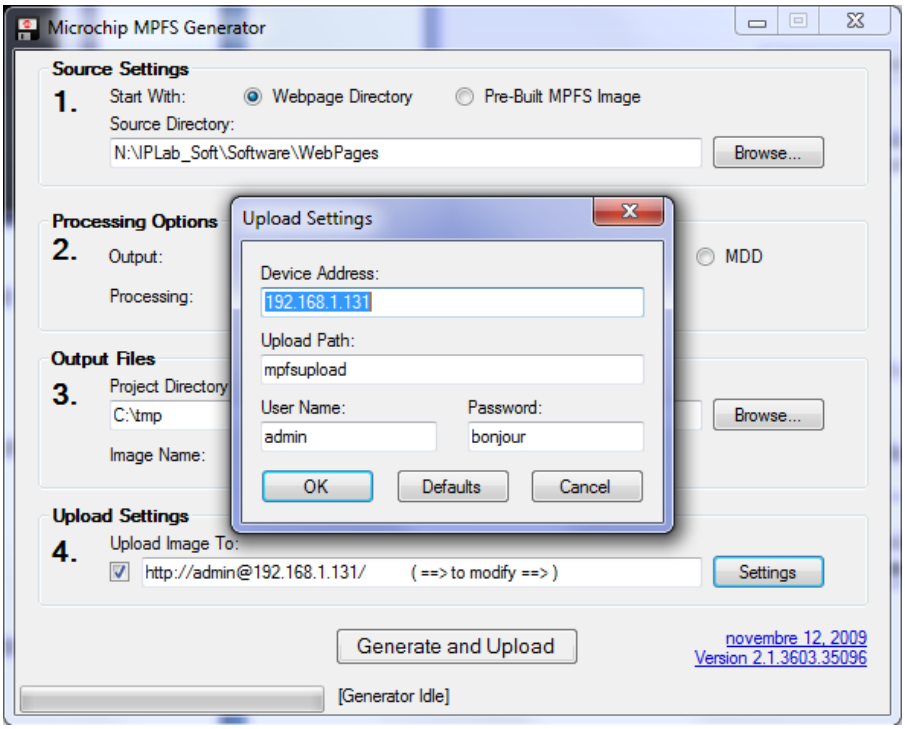
Download source page on the website

Download web page compiler:
http://www.labotronik.com/Documentation/IPLab/software/MPFS2.zip

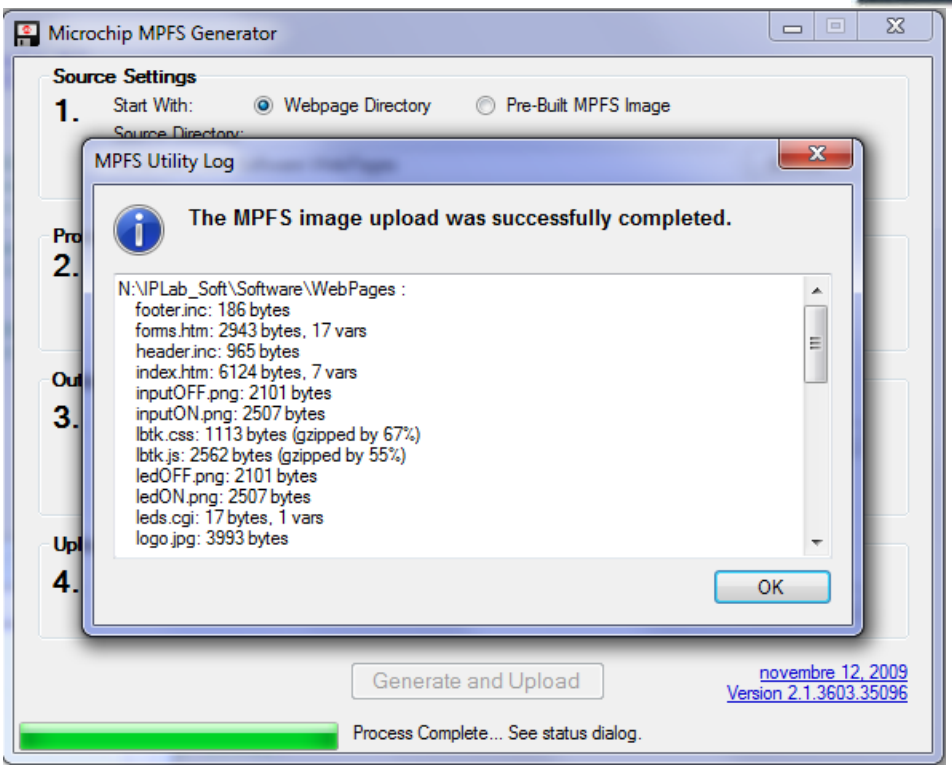
Do your own modification in the source code, configure MPFS2 software and click on “generate and upload”. It will compile files, to give the .bin file, and download it to the board



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Note :
User name : admin
password : admin



7. Technical support

You can reach the technical support by register into the forum of LabotroniK or you can send an email to **support@labotronik.com**

8. Document revision History

V1.0 – IPLab-8-rly board user manual Initial version